

REMARKS

Claims 1-31 are in the case. Claims 1-19 are withdrawn.

Claims 20-31 are under consideration. The claims are non-finally rejected under 35 USC § 102 and 103.

Claims 22 - 24 have been canceled by this amendment.

Claims 20, 25, 27, and 30 have been amended to more clearly define Applicant's invention.

No new matter has been added.

Withdrawal of Rejections / Objections

Applicants gratefully acknowledge the withdrawal of the previous objections to claim 20 and the rejections under 35 USC § 102(b) and (e) over Mirkin and Barber-Guillemund.

Rejections Under 35 U.S.C. §102(a/b)

Claims 20, 21 and 23-31 are rejected under 35 U.S.C. § 102(a/b) as being anticipated by Niemeyer et al. (*Chembiochem*, 2001, 260-264; hereinafter "Niemeyer").

Niemeyer teaches the linking of several streptavidin "nanoparticles" together via double stranded DNA ligands. Niemeyer does not teach the linking of metallic particles, nor does Niemeyer teach methods for creating a nanoparticle having a single, single stranded DNA ligand. The examiner notes that only the year of Niemeyer is cited in the Information Disclosure Statement. The full citation for Niemeyer is "Niemeyer et al., *ChemBioChem* (2001), 2(4), 260-264". Volume 2 and issue 4 correspond to a publication date of 4/1/2001.

The examiner finds that Niemeyer teach all the elements of the rejected claims. Applicants traverse.

Claim 20 has been amended to include the limitation that the particle is metallic and the ligand is a single stranded DNA. Basis for the limitation of a metallic nanoparticle is found in original claim 22 and throughout the specification. Basis for the limitation of the single stranded DNA ligand is found in examples 2 and 3 of the specification and throughout.

Niemeyer does not teach metallic nanoparticles having a single, single stranded DNA ligand attached thereto. Thus, Niemeyer does not teach all the elements of the claimed invention and, as such, the invention is not anticipated by Niemeyer.

Rejections Under 35 U.S.C. §103(a)

Claim 22 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Niemeyer in view of Mirkin et al. (U.S. Patent No. 6,361,944; hereinafter “Mirkin”).

The teachings of Niemeyer is given above.

Mirkin teach the creation of conglomerates of metallic particles linked by DNA ligands for the purpose of detecting specific species of DNA. Mirkin does not teach the assembly of ordered geometric structures comprising the nanoparticle – ligand complexes of the invention where the nanoparticle comprises a single ligand.

It is the Examiner’s opinion that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teaching of Niemeyer of the formation of geometric structures to the metallic particles of Mirkin to derive the present invention. Applicants traverse.

MPEP 2143 sets out the standard for a *prima facie* case of obviousness under 35 USC § 103 and states:

“[T]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. “

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Applicants submit that the combination of Niemeyer in view of Mirkin does not support a *prima facie* case of obviousness because not all the elements of the invention are taught and the skilled person would have no reasonable expectation of success in deriving the invention by the combination of these references.

Claim 22 has been canceled and the limitations of that claim incorporated into Claim 20 as amended.

Applicants submit Niemeyer does not teach the skilled person how to form geometric nanostructures absent the use of super coiled ds DNA. The geometric structures of Niemeyer rely on the ionic properties of super coiled DNA double helices that are characteristic of double stranded DNA (See page 262, first full paragraph and figure 4). Niemeyer uses alterations in the ionic strength of the solution to construct his geometric structures. Niemeyer does not teach how a nanoparticle having a single, single stranded DNA ligand might be incorporated into a similar geometric structure absent the properties of super coiled dsDNA.

Mirkin does not teach a single ligand on a metallic particle. The object of the disclosure of Mirkin is to detect DNA and not create geometric structures for nanofabrication. Consequently it is not an object of Mirkin to design nanoparticles with single ligands, but rather to design nanoparticles with multiple ligands to maximize detection of the DNA. Although Mirkin illustrate metallic nanoparticles aggregated by single stranded DNA hybridization, the aggregates are created via multiple ligand interactions and ordered geometric structures are not created (see figs 5, 17, 20 and 22).

Thus whereas Neimeyer teaches the formation of ordered geometric structures linked by single dsDNA ligands (created through the ionic properties of dsDNA) and Mirkin teach metallic particles aggregated by multiple single stranded DNA ligands, there is no teaching, absent applicants' invention, as to how to create a metallic particle having a single, single stranded DNA ligand for the formation of a geometric structure. Applicants have solved this problem through the discovery that a particle having a single, single stranded DNA ligand may be produced and purified by the methods of the invention prior to assembly (see the discussion in the specification on page 13, beginning on line 11 and examples 3 and 4) . Only when this species has been produced can the geometric structures of the invention be produced. This teaching is absent from Niemeyer or Mirkin.

In view of the foregoing, Applicants submit that the combination of Neimeyer and Mirkin do not support a *prima facie* case of obviousness under 35 USC § 103 and respectfully request withdrawal of this rejection.

Should the Examiner wish to discuss any issues involved in this application, the Examiner is respectfully invited to contact the undersigned at the telephone exchange set forth below. Should there be any fee due in connection with the filing of this Amendment, please charge such fee to Deposit Account No. 04-1928 (E. I. du Pont de Nemours and Company).

Respectfully submitted,

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